August 1966

SOYBEAN PROCESSING AND UTILIZATION

A Selected List of References 1955–1965

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PREFACE

This bibliography lists periodical articles, books, and patents (foreign and domestic) issued in the ten year period 1955-1965. All citations except those to patents have been examined and verified by the compiler. Patents cited were obtained from Chemical Abstracts.

The soybean has shown the most phenomenal development of any crop in the United States during the last thirty years. Soybean production has increased twelvefold during that time. The soybean crop is highly profitable to the American farmer and is the leading cash export farm commodity.

The processing and utilization of soybeans involve technical and marketing problems in the area of domestic consumption and in the export field. This bibliography is designed to chart the past decade's progress and suggest the future direction of research in the processing and utilization of the fourth most valuable agricultural crop of the United States.

Abbreviations for the titles of publications cited are taken from the American Standard for Periodical Title Abbreviations.

All foreign language titles have been translated into English with the original language indicated. Some less well-known languages, such as Hungarian, contain summaries in English, French, or German. Japanese publications are listed both in the translated and Romanized forms. The abbreviation "Ref." in an entry means that the article contains 10 or more references to other literature.

The bibliography is classified by subject and contains an author and subject index. Most items are followed by brief annotations, and the source of abstracts is indicated.

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Compiled by Otto Kirchner-Dean
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Special Bibliographies Section

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PROCESSING OF MEAL

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PROCESSING OF OIL

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184. U. S. AGRICULTURAL RESEARCH SERV. NORTHERN UTILIZATION RESEARCH AND DEVELOPMENT DIV. Processing oilseeds, oil, and meal; a list of publications for 1964 of the Division. U. S. Agr. Res. Serv. ARS-71-24-3, 1 p. Feb. 1965. A381 R31Ac

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Chem. Abstr. 52:7737d
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To Archer-Daniels-Midland Company.

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Chem. Abstr. 54:19416d
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187. WHITE, H. B., and QUACKENBUSH, F. W. A simplified technique for analysis by alkali isomerization. Amer. Oil Chem. Soc. J. 36(12):653-656. Dec. 1959. 307.8 J82

Includes soybean oil. Simplified technique ("bottle method") in which the sample is isomerized with potassium-t-butoxide in a reagent bottle at 60° F for 20 hours.

188. WILDING, M. D., RICE, E. E., and MATTIL, K. F. The effect of processing conditions upon the nutritional quality of vegetable oils. Amer. Oil Chem. Soc. J. 40(2):55-57. Feb. 1963. 307.8 J82

Chem. Abstr. 59:4479e

A discussion of the relationship between heat treatment during processing and nutritional qualities.

189. WOLFF, I. A., and MIWA, T. K. Effect of unusual acids on selected seed oil analyses. Amer. Oil Chem. Soc. J. 42(3):208-215. Ref. Mar. 1965. 307.8 J82

Automatic analytical hydrogenation apparatus for rapid determination of total unsaturation.

190. YOUNGS, C. G., and SUBBARAM, M. R. Determination of the glyceride structure of fats: gas-liquid chromatography of oxidized glycerides. Amer. Oil Chem. Soc. J. 41(3):218-221. Ref. Mar. 1964. 307.8 J82

Chem. Abstr. 60:10935b

Distribution of saturated acids within the glycerides of soybean oil.

Adulteration

191. BARTLETT, J. G., and MAHON, J. H. Identification of oils and the detection of oil adulteration by differential infrared spectroscopy. Ass. Offic. Agr. Chem. J. 41(2):450-459. Ref. May 1958. 381 As7

Chem. Abstr. 52:15774i

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Chem. Abstr. 51:8315i

Food Sci. Abstr. 29:1361

English summary.

δ-Tocopherol occurs only in soybean and mustard seed oil.

193. FIRESTONE, D. Report on spectrophotometric methods for fats and oils. Ass. Offic. Agr. Chem. J. 38 (3):657-663. Aug. 1955. 381 As7

Chem. Abstr. 49:16467f

A procedure for detection of soybean oil adulteration of commercial corn oils.

194. GODED Y MUR, A., GIMENEZ RUESGA, R., and FRANCISCO GALDEANO, C. DE. Determination of soybean oil to olive oil. An. de Bromatologia 11(2): 261-264. 1959. 389.8 An1

Chem. Abstr. 53:22601h

195. KAUFMANN, H. P., and APARICIO, M. Analysis of alien fats in olive oil through paper chromatography. (Sp) Madrid, Spain. Inst. Invest. Veterinarias 11:179-184. Ref. 1961. 41.9 M262

Chem. Abstr. 57:4782d

196. KUMAR, R. A quick method of detecting castor oil in vegetable oil. Amer. Oil Chem. Soc. J. 40(2): 80. Feb. 1963. 307.8 J82

Chem. Abstr. 58:8151e

Soybean oil included.

197. MARTINENGHI, G. B., and BALESTRINI, G. The Halphen reactions for linseed oil. I. Olearia 10 (1/2):5-8. Jan./Feb. 1956. 307.8 OL2

Food Sci. Abstr. 29:1362

Summary in English.

Used for detecting linseed oil in edible oils including soybean oil.

198. PAOLINO, F. The fatty acids of tall oil and their use in foods. Rass. Chim. 10(4):25-28. July/Aug. 1958. 385 R18

Chem. Abstr. 53:9668c

Adulteration of soybean oil.

199. PRIORI, O. Chromatographic detection of oils from Cruciferae in mixture with other plant oils. Olii Mineral.; Grassi Saponi; Colori Vernici. 33(2):23-25. Feb. 1956. 307 OL3

Chem. Abstr. 50:11034e

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200. SANDER, E. H., and BIRD, E. W. Detection of milk fat adulteration. J. Dairy Sci. 45(3):317-322. Mar. 1962. 44.8 J822

Chem. Abstr. 57:5069h

Detection of soybean oil included.

201. ZIMMERMANN, G., HILLINGER, I., and GUTFINGER, T. Spectrophotometric researches in edible oils and fatty foods. Israel. Res. Coun. Bull. 9C(3):144-148. Ref. Apr. 1961. 330.9 Is72B

Method for the detection of adulteration of oils and fatty foods including soybean oil.

Bleaching

202. ARMSTRONG, M. R., and IRELAND, C. E. The bleaching of soybean oil. A spectrophotometric evaluation. Amer. Oil Chem. Soc. J. 35(8):425-428. Ref. Aug. 1958. 307.8 J82

Chem. Abstr. 52:15927b

Results are expressed by Freudlich isotherms, and a bleaching chart is given. In bleaching soybean oil primary attention is given to the removal of green pigment.

203. CROSSLEY, A., DAVIES, A. C., and PIERCE, J. H. Keeping properties of edible oils. II. Refining by treatment with alumina. Amer. Oil Chem. Soc. J. 39(3):163-165. 307.8 J82

Gives comparative effects of earth bleaching and alumina treatment for soybean oil.

204. ELSTON, A. A. Bleaching vegetable oils. U. S. Pat. 2,795,595. June 11, 1957.

Chem. Abstr. 51:12514e

Soybean oil is bleached to obtain oil of improved color.

To DuPont de Nemours (E. I.) & Company.

205. KOGLER, H. P. The manufacture and properties of bleaching earths and their applications in the oil and fat industries. (Ge) Fette, Seifen, Anstrichmittel 65 (10):834-838. Oct. 1963. 384 C422

Chem. Abstr. 60:5757d

English summary.

Bleaching soybean oil.

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Chem. Abstr. 52:8484a

Including soybean oil.

207. MATYGINA, L. M. Use of bleaching elements of Far East deposits in purification of soybean oil. (Rus) Masl. Zhir. Prom. 7:14-16. July 1963. 307.8 M37

Color

208. BALBI, G. Some causes of the yellowing of stand oils during their manufacture. (Fr) Oleagineux 13(1):63-64. Jan. 1958. 77.8 OL2

Chem. Abstr. 52:12418c

Simple test for determining whether a refined drying oil will yield a light-colored stand.

209. BLANK, R. E., and ARTERS, A. A. Color improvement of raw or degummed drying or semidrying oils. U. S. Pat. 2,727,051. Dec. 13, 1955.

Chem. Abstr. 50:4528g

Soybean oil of G-H color 11 is changed to G-H color 3-4 by this treatment.

To Sherwin-Williams Company.

210. COONEY, P. M., HODGE, J. E., and EVANS, C. D. Development of color in fats stabilized with amino-hexose-reductones. Amer. Oil Chem. Soc. J. 35(4):167-171. Apr. 1958. 307.8 J82

Chem. Abstr. 52:8509e

Soybean-oil-color research.

211. GOODING, C. M. Winterization of refined oils. U. S. Pat. 3,048,491. Aug. 7, 1962.

Chem. Abstr. 59:4482h

To Corn Products Company.

212. HARADA, I., SARATANI, Y., and ISHIKAWA, M. Studies on the color reversion of refined and deodorized soybean oil. I-III. (Ja) Agr. Chem. Soc. Jap. J. 34(7):545-562. 1960. 385 Ag8

Chem. Abstr. 54:25900i

Relationship between color reversion and tocopherol contents. Influences of iron and antioxidants on color reversion.

213. KAMADA, H., EBINE, H., and NAKANO, M. Browning reaction of soybean products. XI-XIII. (Ja) Tokyo. Food Res. Inst. Rep. 17:148-161. Ref. Mar. 1963. 389.9 T57

English summary.

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Food Sci. Abstr. 28:205

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moval of higher melting glycerides from an oil. Winterizing means having clear fluid at various temperature ranges.

216. PROCTOR & GAMBLE. Winterizing hardened soybean oils. Brit. Pat. 962,814. July 1, 1964.
Chem. Abstr. 61:9964a

217. SCHMID, D. F., and BAUER, F. J. Winterization of oils with sucrose partially esterified with fatty acids. U. S. Pat. 3,059,009. and 3,059,010. Oct. 16, 1962.
Chem. Abstr. 58:1654a
To Proctor & Gamble Company.

218. SIDWELL, C. G., and others. The use of thiobarbituric acid as a measure of fat oxidative. Amer. Oil Chem. Soc. J. 31(12):603-606. Ref. Dec. 1954. 307.8 J82
Food Sci. Abstr. 27:1851
H. Salwin, M. Benca, and J. H. Mitchell, joint authors.
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Chem. Abstr. 52:19188h
To Hans G. Grossmann, executor of the deceased inventor's estate.

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Color and bleach methods are those used to determine the amount of color in an oil, how easy it is and how much it costs to remove that color, and how much color remains in the oil after bleaching.

Extraction

221. ARNOLD, L. K., and CHOUDHURY, R. B. R. Ethanol extraction of soybean oil. Amer. Oil Chem. Soc. J. 39(8):379-380. Ref. Aug. 1962. 307.8 J82
Chem. Abstr. 57:11329a
Extraction of soybean flakes with 90, 95, 98, and 100 o/o ethanol.

222. ARNOLD, L. K., and CHOUDHURY, R. B. R. Extraction of soybean and cottonseed oil by four solvents. Amer. Oil Chem. Soc. J. 37(9):458-459. Sept. 1960. 307.8 J82
Chem. Abstr. 54:23373b
The solvents used were "Commercial" hexane, "high purity" hexane, "pure" hexane" and benzene.

223. BELOBORODOV, V. V. Extraction of vegetable oil from oil cakes. (Rus) Zh. Priklad. Khim. 31(10): 1565-1572. Oct. 1958. 385 Z64
Chem. Abstr. 53:3738i
Soybean oil included.

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Chem. Abstr. 51:14293f
Diagram of the apparatus, formulas, and the extraction curves as a function of time are given.

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Chem. Abstr. 55:2146b
Abstract of thesis (Ph. D.)-Iowa State University of Science and Technology. 69 p.

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Chem. Abstr. 55:13878e
E. P. Jones, C. R. Scholfield, W. Chorney, and J. Scully, joint authors.
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Chem. Abstr. 61:16317d

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J. J. Spadaro, M. L. Parades, E. L. D'Aquin, and H. L. E. Vix, joint authors.

The bench-scale unit should also find application in connection with other processes using the unit operations of extraction and filtration.

230. GREINER, J. W., and FEVIG, G. A. Countercurrent extraction of steroids. U. S. Pat. 2,839,544. June 17, 1958.
Chem. Abstr. 52:19026f
To Upjohn Company.

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Chem. Abstr. 54:23376i

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Chem. Abstr. 61:2399a

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Chem. Abstr. 57:7401c
H. A. Moser, C. D. Evans, and J. C. Cowan, joint authors.
Unsaponifiables extracted from 10 lots of refined soybean oil subjected to liquid-liquid chromatographic separations.

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Chem. Abstr. 58:14325b
Solvent extraction methods of oil production.

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Food Sci. Abstr. 28:2280
Effect of different solvents on the yield and characteristics of soybean oil discussed.

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Chem. Abstr. 60:3204e
English summary.

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Chem. Abstr. 54:13692h
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Chem. Abstr. 55:3871g
To Honen Oil Manufacturing Company.

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Chem. Abstr. 50:3783e
To Chiyoda Chemical Industries Equipment Company.

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Chem. Abstr. 56:12047e
K. M. Brobst, H. Tai, and C. E. Ireland, joint authors.
The reversion flavor isolated from revered-but-not-rancid soybean oil was separated into 14 fractions by gas-liquid chromatography.

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Chem. Abstr. 49:10543d
The carbonyl index method may be used in evaluating the flavor stability of edible oils.

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Relationship between reversion flavor in soybean oil, carbonyl compounds and linolenic acid.

245. CHANG, S.S. A new technique for the isolation of flavor components from fats and oils. Amer. Oil Chem. Soc. J. 38(12):669-671. Dec. 1961. 307.8 J82

Chem. Abstr. 56:12047b

Continuous process for the isolation of flavor compounds of oils including soybean oil.

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Food Sci. Abstr. 27:724

Study shows that oxidative polymers can be unintentionally introduced into soybean oil and cause reversion.

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A general article followed by a discussion period.

248. FRANKEL, E. N. and others. Effect of antioxidants and metal inactivators in tocopherol-free soybean oil. Fette, Seifen, Anstrichmittel 61(10):1036-1039. Ref. Oct. 1959. 384 C422

Chem. Abstr. 55:12618g

In English.

P. M. Cooney, H. A. Moser, J. C. Cowan, and C. D. Evans, joint authors.

Flavor reversion in soybean oil.

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Chem. Abstr. 55:5994f

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Chem. Abstr. 60:9825f

A test for the determination of certain oxidized fats. Soybean oil included.

251. KEPPLER, J. G., and others. Components of the hardening flavor present in hardened linseed oil and soybean oil. Amer. Oil Chem. Soc. J. 42(3):246-249. Ref. Mar. 1965. 307.8 J82

J. A. Schols, W. H. Feenstra, and P. W. Meijboom, joint authors.

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Carbonyls from soybean oils.

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English summary.

Chem. Abstr. 54:14494b

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Chem. Abstr. 61:15265a

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Chem. Abstr. 51:7607f

H. A. Moser, R. S. Gurley, and C. D. Evans, joint authors.

Sulfur compounds of the tridentate class have been found to be effective in the stabilization of soybean oil.

256. SEALS, R. G., and HAMMOND, L. G. The buttery flavor of reverted soybean oil. (Abstr) Amer. Oil Chem. Soc. J. 42(3):124A-125A. Mar. 1965. 307.8 J82

Gas chromatography used in the analysis.

257. SIMS, R. J., MATTIL, K. F., and LEHMANN, W. J. Processing soybean oil to retard flavor reversion. U. S. Pat. 2,872,465. Feb. 3, 1959.

Chem. Abstr. 55:22872g

To Swift & Company.

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C. M. Gooding, C. F. Brown, and D. Melnick, joint authors.

Citric acid was found to be an effective metal-deactivating agent for stabilizing soybean oil against oxidation and flavor reversion, when used in salad oil, shortening oil, and margarine.

Heat treatment

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S. Ishii, H. Sakai, and K. Arai, joint authors.

English summary.

The change of viscosity was remarkable. As heating time increased, viscosity increased and viscosity index decreased.

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Chem. Abstr. 57:11633f

Value of available lysine is improved by heat treatment but is decreased by over-heating. Available lysine of soybean is about 4.7 percent and availability is 75 percent.

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262. COONEY, P. M., and others. Influence of heat on oxidative stability and on effectiveness of metal-inactivating agents in vegetable oils. Amer. Oil Chem. Soc. J. 35(4):152-156. Apr. 1958. 307.8 J82

Chem. Abstr. 52:8590g

C. D. Evans, A. W. Schwab, and J. C. Cowan, joint authors.

Soybean oil stability research at Peoria, Ill. The mechanism of autoxidation by polyphenols in oils is discussed.

263. CRAMPTON, E. W., and others. Studies to determine the nature of the damage to the nutritive value of some vegetable oils from heat treatment. IV. Ethyl esters of heat-polymerized linseed, soybean and sunflower seed oils. J. Nutr. 60(1):13-24. Ref. Sept. 10, 1956. 389.8 J82

R. H. Common, E. T. Pritchard, and F. A. Farmer, joint authors.

Food Sci. Abstr. 29:912

Rat feeding trials to study the nutritive value of certain fractions prepared from heated soybean and other oils.

264. HANNEWIJK, J., and HAIGHTON, A. J. Differential thermal analysis. III. Melting curves of oils and fats. Amer. Oil. Chem. Soc. J. 35(9):457-461. Sept. 1958. 307.8 J82

Soybean oil included in the study.

265. JANICEK, G., and POKORNY, J. Alterations in fats induced by heating with nonlipid substances. (Ge) Nahrung 5(4):387-398. Ref. 1961. Libr. Cong.

Chem. Abstr. 56:10306e

English summary.

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Chem. Abstr. 52:14432h

Method applied to soybean oil to determine the effect of heating.

267. UEZUMI, N., YAMADA, T., and FUKUDA, H. Chemical changes in edible oils due to heating. Eiyo to Shokuryo (J. Jap. Soc. Food Nutr.) 15(3):15-18. 1962. 389.9 J27

Soybean oil heated intermittently for 20 hours.

268. WURZIGER, J., and JUNKER, M. A study of thermally oxidized fats. (Ge) Deut. Lebensm. Rundsch. 59(5):133-138. May 1963. 389.8 D482

Chem. Abstr. 59:11765h

Changes occurring on heating noted in soybean oil.

Hydrogenation

269. ALBRIGHT, L.F. Quantitative measure of selectivity of hydrogenation of triglycerides. Amer. Oil Chem. Soc. J. 42(3):250-253. Mar. 1965. 307.8 J82

Hydrogenation of soybean oil.

270. ALLEN, R. R. Practical aspects of hydrogenation. Amer. Oil Chem. Soc. J. 39(10):457-459. Ref. Oct. 1962. 307.8 J82

Table gives composition of two hydrogenated soybean oils.

271. ATRAMONOV, P.A. Structure of isoacids formed in the process of hydrogenation of vegetable oils. (Rus) Zhur. Prikl. Khim. 28(7):775-777. July 1955. 385 Z64

Chem. Abstr. 49:14349c

Iodine numbers given and principal Raman lines.

272. BEAL, R.E., and LANCASTER, E.B. Effect of agitation on selectivity in the hydrogenation of soybean oil. Amer. Oil Chem. Soc. J. 31(12):619-625. Ref. Dec. 1954. 307.8 J82

Chem. Abstr. 49:2099d

Food Sci. Abstr. 27:1821

Change from turbine to gas dispersion agitation resulted in a more selective hydrogenation with respect to unsaturates.

273. BOELHOUWER, C., SNELDERWAARD, J., and WATERMAN, H.I. Problems of selectivity in the hydrogenation of linoleic acid esters. Amer. Oil Chem. Soc. J. 33(4):143-146. Apr. 1956. 307.8 J82

Chem. Abstr. 50:8309c

Data plotted from the hydrogenation of soybean oil in terms of saturated acids and iodine values.

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Chem. Abstr. 51:4032b

To Swift & Company.

275. DAHMAN, P.M., HERTJES, P.M., and WATERMAN, H. I. Sulfurous acid as catalyst in the fat industry. Investigations on the process of hardening with sulfurous anhydide. (Fr) Chim. Indus. 64(5):560-562. Nov. 1950. 383 C42

Chem. Abstr. 49:12855i

The physiochemical characteristics of the raw and processed oils are tabulated.

276. EVANS, C.D., and others. Partial hydrogenation and winterization of soybean oil. Amer. Oil Chem. Soc. J. 41(4, tech. sect.):260-263. Ref. Apr. 1964. 307.8 J82

R.E. Beal, D.G. McConnell, L.T. Black, and J. C. Cowan, joint authors.

Chem. Abstr. 61:848g

Study of soybean oils low in linolenic acid.

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Chem. Abstr. 60:1940h

278. FRANKEL, E.N., and others. Homogeneous catalytic hydrogenation of unsaturated fats: cobalt carbonyl. Amer. Oil Chem. Soc. J. 42(2):130-134. Ref. Feb. 1965. 307.8 J82

E.P. Jones, V.L. Davison, E. Emken, and H. J. Dutton, joint authors.

Soybean methyl esters.

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Chem. Abstr. 60:10936a

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Chem. Abstr. 53:3538h

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Chem. Abstr. 50:11,690e

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Chem. Abstr. 57:3578a

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To Swift & Company.

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Chem. Abstr. 55:21295e

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Chem. Abstr. 56:9174b

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H.A. Moser, P.M. Cooney, and J.E. Hodge, joint authors.

Chem. Abstr. 5°:5857c

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To Nippon Oil Company.

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Chem. Abstr. 50:8236a
To Sherwin-Williams Company.

381. WIJNBERG, J. Neutralizing fatty oils. U. S. Pat. 2,848,468. Aug. 19, 1958.
Chem. Abstr. 52:21175c
To Aktiebolaget Separator.

382. WITTE, N. H., and SIPOS, E. Purified soybean oil and xanthophyll concentrate by-product. U. S. Pat. 3,069,443. Dec. 18, 1962.
Chem. Abstr. 58:4977b
To Central Soya.

383. WOLFF, H., and HAYES, L. P. Degumming of vegetable oils. U. S. Pat. 2,754,309. July 10, 1956.
Chem. Abstr. 50:15105f
To Staley (A. E.) Manufacturing Company.
The treated oils do not darken or flock.

PROCESSING OF BEANS

General

384. ALTSCHUL, A. Proper processing of soybeans and cottonseeds to obtain maximum benefit of the proteins. Israel. Res. Counc. Bull. 9C(3):136-140. Apr. 1961. 330.9 Is72B
Study of soybean processing to make for maximum feeding efficiency.

385. ANTIOXIDANT effect of soya-bean. (Abstr) J. Sci. Food Agr. 9(8):ii-73. Aug. 1958. 382 So12
The antioxidant would appear to be a derivative of tocopherol.

386. BEGUM, A., and EDEN, W. G. Influence of defoliation caused by insects on yield and quality of soybeans. J. Econ. Ent. 58(3):591-592. June 1965. 421 J822

387. BLACK, L. T., KIRK, L. D., and MUSTAKAS, G. C. The determination of residual alcohol in defatted alcohol washed soybean flakes. Amer. Oil Chem. Soc. J. 38(9):483-485. Sept. 1961. 307.8 J82
Chem. Abstr. 55:25295b
Relative error of less than 1 percent was obtained.

388. BLACK, L. T., and MUSTAKAS, G. C. Gas-chromatographic determination of residual hexane in hexane-extracted soybean flakes. Amer. Oil Chem. Soc. J. 42(1):62-64. Jan. 1965. 307.8 J82

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Chem. Abstr. 51:11610g
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392. BROCHE, M. G. The French oil-mills and the problem of the soybean. (Fr) Rev. Franc. Corps Gras 10(11):587-594. Nov. 1963. 307.8 R32

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Chiefly processing for feed.

394. CAREW, L. B., and NESHEIM, M. C. The effect of pelleting on the nutritional value of ground soybeans for the chick. Poultry Sci. 41(1):161-168. Ref. Jan. 1962. 47.8 Am33P
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Chem. Abstr. 54:7837d
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396. CASE HISTORY: Solving a soybean processing plant's corrosion problem-with stainless tubing. Amer. Miller:88(6):22-23. June 1960. 298.8 Am32

This soybean processing plant is continous, automatic, and corrosion free.

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Chem. Abstr. 59:7760h

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Chem. Abstr. 52:11443f

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Food Sci. Abstr. 28:2056.

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Chem. Abstr. 56:13308b

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Chem. Abstr. 49:13552d

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Chem. Abstr. 61:8052b

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Chem. Abstr. 54:7914e

Method based on Stroke"s law.

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Food Sci. Abstr. 28:857

Amount of moisture related to caking and flow characteristics.

408. FUJISAWA, S. Rapid fermentation of soy sauce. Jap. Pat. 7199. Oct. 30, 1954.

Chem. Abstr. 50:3709b

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Chem. Abstr. 54:777b

To Noda Industrial Science Research Institute.

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Inhibits Rhizopus sp. utilized in fermentation of soybeans in making tempeh.

412. HIROSE, K. Debittering of soybeans. U. S. Pat. 2,901,353. Aug. 25, 1959.

Chem. Abstr. 54:7000c

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English summary.

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Chem. Abstr. 56:689c

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Esperanto summary.

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Great Britain.

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Chem. Abstr. 49:4772i

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Method devised to make tempeh rapidly and in large amounts by pure-culture fermentations in shallow wooden and metal trays.

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Chem. Abstr. 51:13264c

To Nichiman Food Industries Company.

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English summary.

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H. Ebine, M. Nakano, H. Hieda, and H. Sasaki, joint authors.

English summary.

A description of the process and an indication of its acceptability.

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Chem. Abstr. 54:10231g

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Chem. Abstr. 61:6277g

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Chem. Abstr. 50:1228g

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English summary.

Decrease and disappearance of amino acids in the

homogenized form of old seeds show a destruction of protein reserves.

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A. M. Nash, A. C. Eldridge and W. J. Wolf, joint authors.

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Chem. Abstr. 58:1311e

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Chem. Abstr. 60:15064c

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Chem. Abstr. 54:3895f

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Chem. Abstr. 56:4625i
To Archer-Daniels-Midland Company.

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Contains two tables: "Effect of cooking time and added water on nutritive value of soybean flakes"; and "Effect of temperature and cooking on nutritive value of soybean flakes."

435. TEETER, H. M., and others. Investigations on the bitter and beany components of soybeans. Amer. Oil Chem. Soc. J. 32:390-397. Ref. July 1955. 307.8 J82
L. E. Gast, E. W. Bell, W. J. Schneider, and J. C. Cowan, joint authors.
Chem. Abstr. 49:12857g
Food Sci. Abstr. 27:2736
Study of removal and identification of bitter components of edible soybean flour.

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German summary.

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439. WEYERMULLER, G., and SPENCER, M. R. More modern method is developed for soybean processing as rotary driers, in addition to drying, are also used to cool and condition soybean material. Chem. Process. 19(3):16, 20. Mar. 1956. 381 C4235
Preparation of edible soybean meal for animal feed.

440. YAMAGUCHI, S., and EBIHARA, K. Treatment for soybeans or fat-free soybeans. Jap. Pat. 7646. Nov. 19, 1954.
Chem. Abstr. 50:7347d
To Noda Soy Sauce Company.

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Y. Shigeno, S. Sotome, W. Shimada, and K. Fukuda, joint authors.
English summary.

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Abstract of thesis (Ph. D.)-University of Minnesota. 206 p.
Effort to derive a rate of drying equation for soybeans based on air temperature, relative humidity, initial kernel moisture content and size of kernel.

Extraction

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Chem. Abstr. 57:11328h

Gives extraction rates of four solvents: isopentane, pentane, isohexane, and hexane.

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Chem. Abstr. 50:17247a

Loses of lysine and digestible protein reduced when a continuous process was used.

446. CHAPLIN, J. Preparation of soyabeans for direct solvent extraction. Milling 138(14):355-356, 358. Apr. 6, 1962. 298.8 M622

Deals with cleaning, premilling, conditioning, and flaking of the beans.

447. D'AQUIN, E. L., and others. Pilot-plant application of filtration-extraction to soybeans. Amer. Oil Chem. Soc. J. 31(12):606-613. Dec. 1954. 307.8 J82

J. J. Spadaro, A. V. Graci, P. H. Eaves, L. J. Molaison, N. B. Knoepfler, A. J. Crovetto, H. K. Gardner, and H. L. E. Vix, joint authors.

Chem. Abstr. 49:2099c

At the Southern Regional Research Laboratory, New Orleans. Process should be of interest to the small mills faced with the problem of crushing soybeans and one or more oil-bearing materials.

448. DEPMER, W. Pre-treatment of soybeans and their effect on the solvent-extraction. (Ge) Fette, Seifen, Anstrichmittel 65(6):466-469. June 1963. 384 C422

English summary.

Pre-extraction analysis such as bulk-density determination permits a more efficient use of extraction machinery.

449. GUGGENHEIM, K., and others. Nutritive value of human diets as affected by extraction rate of flour and its supplementation with soya meal. Amer. J. Clin. Nutr. 10(3):231-239. Ref. Mar. 1962. 389.8 J824

Chem. Abstr. 56:15923c

E. Perez, J. Ilan, S. Joseph, and A. Goldberg, joint authors.

Soybean meal added improves the nutritive value of bread proteins.

450. GUGGENHEIM, K., and FRIEDMANN, N. Effect of extraction rate of flour and of supplementation with soya meal on the nutritive value of bread proteins. Food Technol. 14(6):298-300. Ref. June 1960. 389.8 F7398

Soy improved the nutritive value of proteins of both white and dark breads.

451. GUNSTONE, F. D., PADLEY, F. B., and ILYAS QURESHI, M. The glyceride composition of seed oil rich in linoleic and/or linolenic acid. (Abstr) Amer. Oil Chem. Soc. J. 42(3):120A. Mar. 1965. 307.8 J82

Soybean oil.

452. HAINES, H. W., PERRY, G. C., and GASTROCK, E. A. Filtration-extraction of cottonseed oil. Indus. Eng. Chem. 49(6):920-929. Ref. June 1957. 381 J825

Food Sci. Abstr. 29:2288.

Extensive bibliography covering aspects common to oil seed extraction.

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Chem. Abstr. 51:6026e

Food Sci. Abstr. 29:1116

A method for determining moisture which involves grinding of the grain and extraction of the water with methanol.

454. HUTCHINS, R. P. Some improvements in design in solvent-extraction plants. Amer. Oil Chem. Soc. J. 32(12):698-699. Dec. 1955. 307.8 J82

Chem. Abstr. 50:2191c

By streamlining design of machinery, costs have been reduced by half.

455. KARNOFSKY, G. B. Removal of solvent from solvent extracted solid organic particles. U. S. Pat. 2,691,830. Oct. 19, 1954.

Chem. Abstr. 49:2761c

To Blaw-Knox Company.

System for continuous solvent removal from particles such as soybean flakes.

456. KAUFMANN, H. P., and ORDE, H. O. VOM. Extraction of oil-seeds with aliphatic fluoro-chlorocarbohydrates I: Extraction of soybeans and cottonseed with 1, 2, 2-trifluoro-trichloroethane. (Ge) Fette, Seifen, Anstrichmittel 57(6):399-401. June 1955. 384 C422

English summary.

Chem. Abstr. 49:13670i
Food Sci. Abstr. 28:187

457. KAUFMANN, H. P. Fractional extraction of lipides from natural products. Ger. Pat. 1,000,225. Jan. 3, 1957.
Chem. Abstr. 53:23011c

458. KEANE, J. D., and SMITH, C. T. Solution hold-up as a factor in oilseed extractor design. Amer. Oil Chem. Soc. J. 35(5):199-203. May 1958. 307.8 J82
Chem. Abstr. 52:10611f
Hold-up was measured for a wide variety of oilseeds. Includes soybean seeds.

459. KOENIG, P. Soluble-protein-rich residues from solvent-extracted oil seeds. Feb. 8, 1962.
Chem. Abstr. 56:14685c
To Metallgesellschaft.

460. LEDBETTER, D. M., WISSEL, H. J., and MASKEY, D. F. Development of Buckeye Moisture Meter for use on oil-bearing materials. Amer. Oil Chem. Soc. J. 30(11):442-447. Nov. 1953. 307.8 J82
Meter found to fill a need in process control in the milling of oil bearing materials.

461. MCDONALD, F. L. Solvent extraction of soybeans (V. D. Anderson totally immersed extractor). Oil Mill Gaz. 67(3):39-40. Sept. 1962. 307.8 Oi53

462. MATSUK, YU. P., and others. Mechanical expulsion of solvent from grist. (Rus) Masl.-Zhir. Prom. 23(3):6-7. 1957. 307.8 M37
Chem. Abstr. 51:9970a
V. N. Kurdyumov, G. D. Malyi, and M. I. Bezuglov, joint authors.
Maximum amount of benzene was expelled from soybean grist at 35 kg./sq. cm. pressure.

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Chem. Abstr. 56:3319i
Leaching as a diffusional process discussed in connection with the extraction of soybean and methods of solution are included.

465. MUSTAKAS, G. C., KIRK, L. D., and GRIFFIN, E. L. Bland undenatured soybean flakes by alcohol washing and flash desolventizing. Amer. Oil Chem. Soc. J. 38(9):473-478. Sept. 1961. 387.8 J82
Chem. Abstr. 55:25077g
This method reduces excessive moisture by low retention time and rapid heat transfer.

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Chem. Abstr. 55:11885e

467. OTHMER, D. F., and AGARWAL, J. C. Extraction of soybeans; theory and mechanism. Chem. Eng. Progr. 51(8):372-378. Aug. 1955. 381 C4232
Chem. Abstr. 49:14350d
Food Sci. Abstr. 28:186
Extraction rate is physically and mathematically defined by the Hagen-Pouiseulle law governing viscous fluid flow in capillaries.

468. OTHMER, D. F., and JAATINEN, W. A. Extraction of soybeans. Indus. Eng. Chem. 51(4):543-546. Apr. 1959. 381 J825
Chem. Abstr. 53:14547d
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M. G. Krishna, S. H. Zaheer, and L. K. Arnold, joint authors.
Chem. Abstr. 49:12858b
Food Sci. Abstr. 27:2727
Effect of extraction method on flavor and other properties of edible soybean oil.

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Chem. Abstr. 49:2099t
The data shows that the loss of water and salt-soluble protein during I and II varied with temperature from 39 percent at 105° C to 89 percent at 135° C.

471. RZHEKHIN, V. P., and POGONKINA, N. I. Interaction between lipides and protein of the oil-bearing seed in oil extraction process. (Rus) Masl.-Zhir. Prom. 23(1):11-13. 1957. 307.8 M37

Chem. Abstr. 51:7741c

Method could be employed in the control of the manufacturing process.

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Chem. Abstr. 50:6705f

English summary.

Methods of decreasing bitter taste of soybean products without destroying antioxidants.

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Soybeans. Discusses and describes the Kennedy and the Hildebrandt extractor including a drying unit and the final stills.

474. SUGARMAN, N. Process of extraction of oil and protein simultaneously from oil-bearing materials. U. S. Pat. 2,762,820. Sept. 11, 1956.

Chem. Abstr. 51:4031c

To Georgia Technological Research Institute.

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Chem. Abstr. 54:6043b

To Ajinomoto Company.

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Chem. Abstr. 54:16479b

To Nisshin Oil Manufacturing Company.

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Outline of the type of material handling equipment which might be used in a well equipped mill for the extraction of oil from soybeans.

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After extraction, spent flakes are automatically elevated to a desolventizer-toaster unit which removes remaining solvent, heat treats the meal with steam, and develops flake's protein for high nutritional value.

479. WHITTEN, M. E., and BAUMANN, L. A. Evaluation of a rapid method for determining oil content of soybeans. U. S. D. A. Tech. Bull. 1296, 32 p. Ref. Nov. 1963. 1 Ag84Te

Chem. Abstr. 60:9825h

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Chem. Abstr. 59:15596d

M. Sasakawa, N. Takagi, and I. Umemoto, joint authors.

To Hankyu Kyoei Bussan Company.

Storage

481. BYSTROV, N. M., and LYSIAKOV, M. P. From the practices of storing peanuts and soybeans at low temperatures. (Rus) Masl.-Zhir. Prom. 19(3):8-9. 1954. 307.8 M37

482. KENNEDY, B. W. Moisture content, mold invasion, and seed viability of stored soybeans. Phytopathology 54(7):771-774. Ref. July 1964. 464.8 P56

483. MILLER, W. J., CLIFTON, C. M., and CAMERON, N. W. Nutrient losses and silage quality as affected by rate of filling and soybran flakes. J. Dairy Sci. 45(3):403-407. Mar. 1962. 44.8 J822

Total losses were lower in the rapidly filled silos.

UTILIZATION

UTILIZATION OF MEAL IN FEED

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Chem. Abstr. 54:11326i

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G. A. McLaren, J. A. Welch, C. D. Campbell, and G. S. Smith, joint authors.

Chem. Abstr. 53:13300c

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K. Bronsch, H. Karg, and E. Dahme, joint authors.

English summary.

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Chem. Abstr. 59:15657e

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Chem. Abstr. 48:10255g

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A. E. Harper, M. Collins, and C. A. Elvehjem, joint authors.

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V. C. Speer, P. G. Homeyer, V. W. Hays, and D. V. Catron, joint authors.

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Study of amino acid content of feed which permits an approximation of its nutritional value. Fifty eight items in the bibliography.

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Chem. Abstr. 51:13091e

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555. EDWARDS, H. M. The current status of essential fatty acid requirements of poultry. Cornell Nutr. Conf. Feed Manufacturers Proc. 1963:93-100. 389.79 C81

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G. B. Garner, M. E. Muhrer, and W. H. Pfander, joint authors.

Chem. Abstr. 51:12248g

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Chem. Abstr. 50:15769f

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Chem. Abstr. 54:3621c

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Chem. Abstr. 51:13101b

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Objective was to determine the amino acid deficiencies in 20 and 24 percent protein corn-soybean oil meal type turkey starting diets, using a 28 percent protein diet as a control.

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Chem. Abstr. 55:15656b

Study of the absorption of zinc from both isolated soy protein and casein.

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Food Sci. Abstr. 28:400

The nutritional value of soybeans.

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Soybean, alfalfa, and corn in various feed combinations tested. Which ration to use depends on prices and availability of the ingredients.

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Chem. Abstr. 50:15766g
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O. S. Davis, D. B. Taylor, and L. P. Doyle, joint authors.

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Chem. Abstr. 52:18171i

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850. GRIMINGER, P., and FISHER, H. Unextracted raw soybeans for laying hens. Feedstuffs 32(12):18. Mar. 19, 1960. 286.81 F322

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851. HAINES, P. C., and LYMAN, R. L. Relationship of pancreatic enzyme secretion to growth inhibition in rats fed soybean trypsin inhibitor. J. Nutr. 74(4):445-452. Ref. Aug. 1961. 389.8 J82

Chem. Abstr. 59:9129c

Study of the relationship between growth depression, restricted diet, and trypsin inhibitor.

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Chem. Abstr. 51:17017d

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862. HINTZ, H. F., and others. Effects of processing and of feeding hay on the digestibility of soybean hulls. J. Anim. Sci. 23(1):43-46. Feb. 1964. 49 J82

M. M. Mathias, H. F. Ley, and J. K. Loosli, joint authors.

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English summary.

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T. W. Perry, R. A. Pickett, and W. M. Beeson, joint authors.

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A. L. Moxon, H. W. Scott, and O. G. Bentley, joint authors.

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Chem. Abstr. 55:6624f

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Chem. Abstr. 54:11173h

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Chem. Abstr. 59:9144e

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J. R. Owen, W. C. Cowsert, and J. T. Miles, joint authors.

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F. B. Weakley, R. E. Campbell, and J. C. Cowan,

joint authors.

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Chem. Abstr. 53:3383a

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Chem. Abstr. 49:12626e

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In poultry rations. Raw soybeans and their effect on fat digestion.

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Chem. Abstr. 60:13638c

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The relationship between raw soybean diet and egg laying.

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Chem. Abstr. 56:9182g

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Study of the possibility of using cooked, dehulled soybeans as a protein supplement for swine.

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Swine.

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O. G. Bentley, H. W. Scott, R. R. Johnson, and A. L. Moxon, joint authors.

Chem. Abstr. 53:8347f

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R. J. Meade, M. Soldevila, and R. S. Grant, joint authors.

Soybeans included in the various rations and experiments.

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Chem. Abstr. 55:18916h

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927. SAXENA, H. C., JENSEN, L. S., and MCGINNIS, J. Influence of dietary protein level on chick growth depression by raw soybean meal. J. Nutr. 77(3):241-244. July 1962. 389.8 J82

Chem. Abstr. 60:913e

Adding an amino acid mixture to raw soybean meal resulted in normal oxygen consumption and normal liver and muscle glycogen levels.

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Chem. Abstr. 58:7186d

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Chem. Abstr. 59:5551g

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Chem. Abstr. 49:4814h

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Chem. Abstr. 55:15756g

W. F. McCaughey, F. E. Todd, and A. R. Kemmerer, joint authors.

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Chem. Abstr. 57:12976a

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Chem. Abstr. 59:11959b

English summary.

Fundamental experiments on heat treatment. Study includes soybeans.

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Swine.

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Chem. Abstr. 49:12628h

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W. Vervack, M. Vanbelle, R. Arnould, and A. Moreels, joint authors.

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To Nippon Oils & Fats Company.

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UTILIZATION OF MEAL FOR INDUSTRIAL USES

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UTILIZATION OF OIL FOR INDUSTRIAL USES

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